

REMARKS

Examiner Interview

A telephonic interview was conducted on August 18, 2004 and August 20, 2004, between Examiner Vargas and Kevin McEnaney. Claim 1 was discussed in view of Coates and Prammer. Applicant offered the distinction between Prammer and the claimed subject matter directed to the claimed calculation of a constituent parameter such as molecular size compared to Prammer's measurement of T1, T2 and D for fluid typing. Examiner Vargas indicated this to be a worthy distinction and would discuss the same with her Primary as well as conduct another search. If these results were in favor of Applicant, it was suggested for Applicant to formalize these distinguishing comments in a written Response.

Approval of Supp IDS, June 10, 2003

Applicant notes its Supplemental IDS electronically submitted on June 10, 2003 has not yet been initialed by the Examiner. Applicant respectfully requests resolution of this outstanding matter.

102 Rejection

Prammer does not teach or suggest "calculating the molecular property for each constituent in the mixture...." Applicants discuss at page 6, paragraph 21, the basic difference between prior art NMR measurement techniques, such as Prammer and Coates, and Applicants novel method. Specifically, Prammer is similar to standard NMR uses, where NMR data is used to determine macroscopic properties of an earth formation, such as fluid typing based on T2, T1 and diffusion measurements. (col. 2: 27-31) However, Prammer does not provide a detailed molecular analysis of properties of individual constituents, such as molecular size distributions, within a particular fluid. Instead, Prammer proposes a method for obtaining measurements of relaxation time and diffusion properties of oil and water contained in the formation pores. (col. 2:27-31) This is distinguished from the claimed "molecular properties" such as molecular size and weight distributions and carbon number distributions determined from T1 and T2, or diffusion measurements. (Applicants' specification, page 12, paragraph 0036.)

Further, although Prammer makes very brief mention of molecular size, it only does so as a background into to theory of NMR technology. (col. 2:14-19) Prammer mentions in the Background of the Invention section only that NMR values such as T1, T2 and D are related to

certain molecular dynamics which are a function of molecular size and inter-molecular interactions. This is a known physics relationship. Applicants do not seek to claim such a broad concept. Such a generic statement of physics does not obviate Applicant's specific claimed invention of obtaining actually determining values of molecular properties, i.e. molecular size distribution, using an NMR downhole tool. For example, Prammer mentions that T2 depends on molecular dynamics which is a function of molecular size. However, Prammer does not disclose how to obtain the molecular size from T2. Even more, Prammer does not disclose that a molecular property is calculated "for each constituent in the mixture." Instead, the bulk fluids sampled by Prammer consist, in the case of oil, many different molecules. Prammer's T2 measurements are not performed for each molecule of the oil sample. Thus, any molecular size derived from Prammer's T2 measurements, although Prammer teaches no such derivation, would only result in a molecular size for the sample as a whole, which contains many different molecules presumably with many different molecular sizes. However, this is somewhat nonsensical as molecular size only makes sense in terms of one molecule at a time.

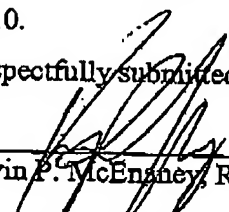
A fair reading of Prammer does in fact teach away from Applicants molecular property determination. Specifically, Prammer is exclusively directed to fluid typing processes determined from T2. (col. 2:27-31) In other words, once Prammer obtains its T2 measurement, indications of whether a sample is oil, water or gas can be interpreted. In this way, Prammer is proceeding away from determining microscopic properties to a more general mixture level indication of oil, water or gas. (Abstract) Prammer nowhere teaches that from T2 measurements, one can progress in the opposite direction to determine more detailed information about constituents within the mixture. Thus, in terms of determining molecular properties in any instance, Prammer teaches away. Furthermore, in terms of Applicant's constituent property determination, Prammer teaches away for the other reason mentioned above, that even if one could interpret Prammer to obtain molecular size from T2, for example, to which Applicants strongly disagree, Prammer would teach provide a molecular size for the mixture, i.e. the oil sample as a whole and not each constituent within the mixture.

CONCLUSION

Applicants believe this paper is fully responsive to each and every ground of rejection and objection cited by the Examiner in the Office Action dated June 10, 2003, and respectfully request reconsideration of the application.

Please charge any applicable fees, or apply any excess, to deposit account number 19-0610.

Respectfully submitted,


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8/23/04
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